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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,451	10/15/2003	Christopher J. Capece	67,108-022; Capece 2-11	6861
7590 10/09/2007 David J. Gaskey Carlson, Gaskey & Olds, PC Suite 350 400 West Maple Road Birmingham, MI 48009			EXAMINER LAM, DUNG LE	
			ART UNIT 2617	PAPER NUMBER
			MAIL DATE 10/09/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/686,451

Applicant(s)

CAPECE ET AL.

Examiner

Dung Lam

Art Unit

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 05 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 1 and 8 rejected under 35 U.S.C. 103(a) as being unpatentable over Jin (US Pub. No. 2003/0012158) in view of **AdmittedPriorArt** (Applicant's admitted prior art).

2. Regarding claim 1, Jin teaches a method of maintaining time information for a wireless communications base station, comprising:

selectively using time information from the data set for conducting a communication involving the base station (The system selects another source of time information from another source when the GPS signal is loss. See Abstract, Fig. 6, [0036-0037, 0019, 0021, 0028]). However, Jin does not teach that the data set is generated in a neural network. **AdmittedPriorArt** discloses that

[0024] Known neural network techniques allow for generating a data set 26 of coefficients that effectively provide a curve fitting function that provides predicted or future time information based upon some initial time input. Neural networks are known and their function and capabilities are sufficiently known that those skilled in the art who have the benefit of this description will be able to choose an appropriate neural network architecture and processing

Art Unit: 2617

techniques to generate a data set that meets the needs of their particular situation.

Therefore, it would have been obvious for one skill in the art at the time of the invention to modify Jin's teaching of GPS time synchronization to use

AdmittedPriorArt's teaching of a data set that is generated by a suitable neural network when there's loss of signal from the GPS. Using a data set generated by a neural network would yield superior result because neural network is known to have the remarkable ability to adaptively learn complicated patterns and derive results that are far too complex for humans or traditional simple software algorithms to handle.

3. Regarding claim **14**, **Jin** teaches a wireless communication device, comprising: a base station controller that determines time information from a global position system (GPS) source of time information and uses the data set for obtaining time information if the GPS source is unavailable to the base station controller. (The system selects another source of time information from another source when the GPS signal is loss. See Abstract, Fig. 6, [0036-0037, 0019, 0021, 0028]). However, Jin does not teach that the data set is generated in a neural network. **AdmittedPriorArt** discloses that

[0024] Known neural network techniques allow for generating a data set 26 of coefficients that effectively provide a curve fitting function that provides predicted or future time information based upon some initial time input. Neural networks are known and their function and capabilities are sufficiently known that those skilled in the art who have the benefit of this description will be able to choose an appropriate neural network architecture and processing techniques to generate a data set that meets the needs of their particular situation.

Art Unit: 2617

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AdmittedPriorArt's teaching of a data set that is generated by a suitable neural network when there's loss of signal from the GPS. Using a data set generated by a neural network would yield superior result because neural network is known to have the remarkable ability to adaptively learn complicated patterns and derive results that are far too complex for humans or traditional simple software algorithms to handle.

4. Claim 4-7, 9, 11-13, 17-20 rejected under 35 U.S.C. 103(a) as being unpatentable over **Jin and AdmittedPriorArt** (Applicant's admitted prior art) further in view of **Telia** (EP 631 453).

5. **Jin and AdmittedPriorArt** teach all the steps of claim 4 and 17. Jin further teaches the step of gathering time information from an external source ([[0036-0037]]); however they do not explicitly teach the step of inputting the gathered time information to the neural network; and generating the data set based on the inputted time information. In an analogous art, **Telia** teaches the step of gathering data to be input to the neural network (C2 L2-25, C3 L46 – C4 L9) and generating data based on the input data (C3 L46 – C4 L9). Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to apply **Telia's** teaching of feeding data to the neural network prior to generating the data to **John and Admitted PriorArt** in order to comply with the way neural network typically operates.

Art Unit: 2617

6. **Jin, AdmittedPriorArt and Telia** teach all the steps of claim 5, wherein Telia further teaches that the gathered time information extends over a selected period (C3 L9 - 18) and including comparing time information from the data set for a period corresponding to the selected period with the gathered time information; and changing at least one characteristic of the neural network when the data set time information does not correspond to the gathered time information within a selected range (C3 L46 - C4 L9, this section describes the well known learning process of the neural network).

7. **Jin, AdmittedPriorArt and Telia** teach all the steps of claim 6, including changing the characteristic of the neural network by changing at least one of a number of layers in the neural network, a number of neurons in the neural network or a complexity factor of the neural network. It would have been obvious to one of ordinary skill in the art at the time the invention was made, to understand that for the neural network to learn, one of the above characteristics would have to be adjusted, as this is a known method of teaching/learning in a neural network.

8. **Jin, AdmittedPriorArt and Telia** teach all the steps of claim 7, including repeatedly performing the steps of comparing and changing until the data set time information corresponds to the gathered time information within the selected range (Telia, C3 L46 - C4 L9).

9. **Jin** in view of **AdmittedPriorArt** teach all the steps of claim 9, except for using an initialization time value and the data set to generate time information until the external source time information becomes available. In an analogous art, Telia teaches

Art Unit: 2617

the concept of using the initialization time value and the data set till the external source available (C3 L46 - C4 L9). Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the above references' teaching with Telia's teaching because it enables the system to sustain its operation even though it loses its external source.

10. Jin and AdmittedPriorArt teach all the steps of claim 11 and 18, except for the data set comprises a plurality of coefficients for generating future time information based on upon a start time (weightings, column 3, line 56). In an analogous art, Telia teaches the concept of using coefficients in neural networks. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for generating future time information based upon a start time because the neural network has to begin its calculations at a starting point data set.

11. Jin and AdmittedPriorArt teach in view of Telia teaches all the steps of claims 12-13 and 19-20, including providing at least more than 24 hours are two weeks of future time information using the data set. It would have been obvious to one of ordinary skill in the art at the time the invention was made, to understand that the choice of how long to provide timing information is one of design choice based on user requirements.

12. Claim 2, 3 and 10, 15, 16 rejected under 35 U.S.C. 103(a) as being unpatentable over **Jin and AdmittedPriorArt** (Applicant's admitted prior art) further in view of "Test Results and Analysis of a Low Cost Core GPS Receiver for Time Transfer Applications",

IEEE International Frequency Control Symposium, J. Blake Bullock et al., pp. 314-322, (1997).

13. **Jin** in view of **AdmittedPriorArt** teach all the limitation of claim 2 and 15, except wherein the data set is useful for a first time interval and including generating another data set for a second, later time interval. However, Bullock teaches that GPS receivers used for time synchronization, while very accurate, are known to lose their signals due to, for example, jamming as a result of RF interference. See pages 314-315 and 317. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify the method of Jin and AdmittedPriorArt to include generating another data set for a later time interval as it is known that GPS signals may be lost as taught by Bullock (pages 314-315 and 317).

14. Jin and AdmittedPriorArt in view of Bullock teach all the steps of claim 3 and 16, including repeatedly generating another data set for subsequent time intervals. See above.

15. Jin and AdmittedPriorArt teach all the steps of claim 10, except for the external source time information comprises GPS time information. In an analogous art, Bullock teaches the use of GPS signals as the external source (pages 314-315 and 317). Therefore, it would have been obvious for one skill in the art at the time of the invention to combine Jin and AdmittedPriorArt's teaching with Bullock's teaching of using GPS signals as the external time source because this would result in a more accurate global time precision.

Response to Arguments

Applicant's arguments with respect to claims 1-~~20~~ have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung Lam whose telephone number is (571) 272-6497. The examiner can normally be reached on M - F 9 - 6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on (571) 272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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